CLAIMS

1.   A detection system including a detection cell (1) having an entry gate (3), the system including drive means (10) for controlling switching of the gate, characterised in that the drive means (10) is arranged to control switching of the gate (3) in a pseudo-random binary sequence.

2.   A detection system according to Claim 1, characterised in that the pseudo-random binary sequence is bit-flipped to reduce noise.

3.   A detection system according to Claim 1 or 2, characterised in that the output is analysed by matrix algebra.

4.   A detection system according to any one of the preceding claims, characterised in that the system is arranged to carry out deconvolution on the cell output using matrix algebra.

5.   An IMS detection system according to any one of the preceding claims, characterised in that the cell (1) has a drift region (4) and that the gate (3) is arranged to control entry to the drift region.

6.   A method of controlling switching of an admittance gate (3) in a detection system, characterised in that the gate (3) is switched in a pseudo-random binary sequence.

7.   A method according to Claim 6, characterised in that the pseudo-random binary sequence is bit-flipped.

8.   A method according to Claim 6 or 7, characterised in that the method includes analysing an output using matrix algebra.

9.   A method according to any one of Claims 6 to 8, characterised in that method includes deconvolution of the output using matrix algebra.